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Psychometric assessment and refinement of the Family Issues scale of the Human Dimensions of Operations (HDO) project

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Defence R&D Canada
Technical Report
DCIEM TR 2001-049
May 2001

National Defence Défense nationale

Canada

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102-01714/

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Abstract

The present report summarizes psychometric analyses and recommendations for item refinement of the *Family Issues* scale a measure included in the predeployment survey of operational stress among Canadian Forces personnel. Inspection of the items comprising the *Family Issues* scale revealed two distinct sections. The first section included 14 items that assessed respondents' family concerns in anticipation of their upcoming deployment with a Likert scale (i.e., 1 – strongly disagree to 5 – strongly agree). The second section assessed respondents' knowledge of the availability of family oriented support services. As the two sections of the Family Issues Scale assess distinct dimensions, and because these sections used different scaling techniques, each section was treated as a separate scale: *Family Attitudes* and *Perceived Support.*

Exploratory factor analyses of the items comprising the *Family Attitudes* scale yielded two separate factors: *Family Concerns* and *Positive Attitudes*. Subsequent reliability analyses of these two factors indicated that the *Family Concerns* factor had a robust alpha value of .81. Reliability analyses of the items within the *Positive Attitudes* factor were disappointing, however, resulting in a very low Cronbach's alpha of .49. The items within the *Positive Attitudes* factor do not appear to tap a single underlying dimension, and the inclusion of these items in further studies is not warranted.

A monomethod-multimeasure analysis was also conducted to determine the relative validity of the *Family Concerns* and the *Family Attitudes* scale. Two versions of the Family Attitudes scale were used in this analysis: 1) a version that included the entire 14 items and 2) a revised 11-item version, constructed to preserve as many of the original Family Attitudes scale. This analysis revealed patterns of correlations that substantiated most hypotheses. Moreover, the pattern of correlations was similar between the *Family Concerns* scale, two versions of the *Family Attitudes* scale, and the other predeployment measures. Indeed, z-tests revealed no significant differences in the magnitude of correlations between each of the three versions of the scale and the other predeployment measures. Ultimately the Family Concerns subscale was deemed to be the optimal version of the scale, due to it's more cohesive factor structure.

Descriptive analyses indicated the perceived availability of several support sources and services. In general most of the listed support sources and services were perceived as being available to respondents' families. Family, friends, and neighbors were expected to be somewhat more available than formal sources of support in the military. Respondents were the most unsure about the availability of civilian support services.

Résumé

Le présent rapport résume les analyses psychométriques et les recommandations visant à peaufiner les éléments de *l'échelle de mesure des questions familiales* destinée à mesurer, en période de pré-déploiement, le stress opérationnel parmi le personnel des Forces canadiennes L'examen des éléments de *l'échelle de mesure des questions familiales* a permis de constater la présence de deux sections distinctes. La première section se compose de quatorze éléments qui évaluent les préoccupations familiales des répondants en prévision de leur déploiement à venir à l'aide de l'échelle Likert (où 1 correspond à « en complet désaccord » et 5, à « tout à fait d'accord »). La deuxième section évalue les connaissances qu'ont les répondants des services de soutien axés sur la famille. Puisque les deux sections de l'échelle évaluent des dimensions distinctes et qu'elles utilisent des techniques d'évaluation différentes, chaque section est traitée comme une échelle séparée : *attitudes familiales* et *soutien perçu*.

Les analyses des facteurs exploratoires des éléments compris dans l'échelle de mesure des *attitudes familiales* a engendré deux facteurs distincts : les *préoccupations familiales* et les *attitudes positives*. Les analyses de fiabilité subséquentes de ces deux facteurs ont indiqué que le facteur relatif aux *préoccupations familiales* avait un coefficient alpha élevé d'une valeur de .81. Les analyses de fiabilité des éléments représentés dans le facteur relatif aux *attitudes positives* étaient cependant décevantes, puisque le coefficient alpha de Cronbach n'était que de .49. Les éléments compris dans le facteur relatif aux *attitudes positives* ne semblent pas faire ressortir une dimension sous-jacente unique, si bien qu'il n'y aurait pas lieu d'inclure ces éléments dans les études ultérieures.

Une analyse monométhode-multimesure a également été effectuée pour déterminer la validité relative des échelles portant sur les *préoccupations familiales* et sur les *attitudes familiales*. Deux versions de l'échelle de mesure des *attitudes familiales* ont été utilisées dans cette analyse : 1) une version qui comprend les quatorze éléments, 2) une version révisée de onze éléments, conçue de façon à préserver le plus possible l'échelle initiale relative aux *attitudes familiales*. Cette analyse a révélé des modes de corrélation qui ont confirmé la validité de la plupart des hypothèses. En outre, le mode de corrélation produit était semblable entre l'échelle de mesure des *préoccupations familiales*, les deux versions de l'échelle de mesure des *attitudes familiales*, et les autres mesures relatives au pré-déploiement. En effet, les tests d'écart réduit n'ont révélé aucune différence significative dans la magnitude des corrélations entre chacune des trois versions de l'échelle et les autres mesures relatives au pré-déploiement. Tout compte fait, la sous-échelle relative aux préoccupations familiales a été jugée la meilleure version de l'échelle étant donné sa structure de facteurs plus cohérente.

Des analyses descriptives ont indiqué que les sujets percevaient comme accessibles plusieurs sources et services de soutien. Dans l'ensemble, les répondants ont perçu comme accessibles à leur famille la plupart des sources et des services de soutien énumérés. La majorité des répondants s'attendaient à recevoir un peu plus de soutien de la part des membres de leur famille, de leurs amis et de leurs voisins que de sources militaires officielles. Ce dont ils étaient le moins sûrs, c'était de l'accessibilité de services de soutien civils.

Executive summary

The Human Dimensions of Operations (HDO) project is a Canadian Forces (CF) initiative to address the impact of operational stress on its personnel. The HDO predeployment questionnaire, developed by the Directorate of Human Resources Research and Evaluation (DHRRE) NDHQ, to support the HDO project, is a multidimensional survey instrument designed to assess various aspects of operational stress. One scale developed by DHRRE personnel specifically for use in the HDO is the *Family Issues scale*. The present report summarizes analyses conducted to establish the psychometric properties, and to facilitate item refinement, of the *Family Issues* scale.

Inspection of the items comprising the *Family Issues* scale revealed two distinct sections. The first section included 14 items that assessed respondents' family concerns in anticipation of their upcoming deployment with a Likert scale (i.e., 1 – strongly disagree to 5 – strongly agree). The second section assessed respondents' knowledge of the availability of family oriented support services. Response options to the second section of the *Family Issues* scale were categorical in nature (i.e., 'yes', 'no', 'don't know'). Given the distinct issues addressed in the two sections of the Family Issues Scale, and because these sections used different scaling techniques, each section was treated as separate scales. The first scale we named *Family Attitudes*, and the second scale was named *Perceived Support*.

Family Attitudes Scale

An initial reliability analysis of the 14-item *Family Attitudes* scale yielded an acceptable Cronbach's alpha of .76. Factor analysis of the scale using a single factor accounted for 27 percent of the variance in responses. However, six of the fourteen items had quite low item-total correlations, suggesting that the scale may tap more than one central factor. Moreover, several of the items had factor loadings that did not reach a minimum exclusion value of .4, again suggesting that a single factor solution may not be the optimal representation of the scale.

A second exploratory factor analysis of the items comprising the *Family Attitudes* scale yielded two separate factors: *Family Concerns* and *Positive Attitudes*. Subsequent reliability analyses of these two factors indicated that the *Family Concerns* factor had a robust alpha value of .81. Reliability analyses of the items within the *Positive Attitudes* factor were disappointing, however, resulting in a very low Cronbach's alpha of .49. The items within the *Positive Attitudes* factor do not appear to tap a single underlying dimension, and the inclusion of these items in further studies is not warranted.

Although the *Family Concerns* factor was found to be reliable in the previous analyses, it may not be the most valid version of the Family Issues scale. Therefore a monomethod-multimeasure analysis was also conducted to determine the relative validity of the *Family*

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Concerns and the *Family Attitudes* scale. Two versions of the *Family Attitudes* scale were used in this analysis: 1) a version that included the entire 14 items, 2) a revised 11-item. The revised 11-item version of the *Family Attitudes* scale was constructed to preserve as many of the original Family Attitudes scale. In this case the 2 dimension factor analytic results were ignored and only the three weakest items of the original 14 items were eliminated. The monomethod-multimeasure analysis revealed correlations that substantiated most hypotheses. Moreover, the pattern of correlations produced was similar between each version of the *Family Attitudes* scale, *the Family Concerns* scale and other predeployment measures. Indeed, z-tests revealed no significant differences in the magnitude of correlations between each of the three versions of the scale and the other predeployment measures.

Perceived Support

Analyses were also conducted on the items assessing the perceived availability of support sources and services. Traditional reliability and exploratory factor analyses could not be used here due to the categorical nature of the response options associated with this section of the questionnaire. Instead frequencies and percentages were computed to determine the relative perceived availability of each support source and service. Overall, individuals in this sample perceived most of the listed support sources and services as being available to their families. For the majority of respondents, family, friends, and neighbors were expected to be somewhat more available than formal sources of support in the military. Respondents were the most unsure about the availability of civilian support services.

Conclusions

The results of this research indicate that family concerns are a prevalent and ongoing issue for deployable military personnel. Similarly, time spent away from family members is rated as one of the most distressing aspects of a military career. Thus, assessing the level of family concerns is essential to ensuring the happiness and efficiency of military personnel. Based upon the psychometric analyses reported here, it is recommended that 7 of the original 14 Family Attitudes items be retained as a Family Concerns scale in future studies. The scale has a good reliability, a consistent and meaningful factor structure, and is related to other military stress scales in predicted ways.

The availability and effectiveness of family support services families can do much to alleviate some of these family-related concerns for military personnel. Assessing soldiers' perceptions about the availability of support services is important step in this process. Answers to these sorts of questions can do much to indicate the availability and visibility of military support services of this nature. Results from this scale may aid in policy decisions concerning which support services may benefit from fine-tuning or expansion. It is suggested that the Perceived Support scale may benefit from the inclusion of items tapping perceived effectiveness of and/or questions tapping individuals' intention to use each service.

Sommaire

Le projet des dimensions humaines des opérations (DHO) est une initiative des Forces canadiennes destinée à évaluer l'incidence du stress opérationnel sur le personnel. Le questionnaire préalable au déploiement, conçu par la Direction de la recherche et de l'évaluation en ressources humaines (DRERH), QGDN, à l'appui du projet DHO, est un instrument d'enquête multidimensionnel destiné à évaluer divers aspects du stress opérationnel. Le personnel de la DRERH a conçu une échelle pour le projet DHO, *l'échelle de mesure des questions familiales*. Le présent rapport résume les analyses effectuées pour établir les propriétés psychométriques de cette échelle et pour faciliter le peaufinage de ses éléments.

L'examen des éléments de l'échelle de mesure des *questions familiales* a permis de constater la présence de deux sections distinctes. La première section se compose de quatorze éléments qui évaluent les préoccupations familiales des répondants en prévision de leur déploiement à venir à l'aide de l'échelle Likert (où 1 correspond à « en complet désaccord » et 5, à « tout à fait d'accord »). La deuxième section évalue les connaissances qu'ont les répondants des services de soutien axés sur la famille. Les choix de réponse dans la deuxième section de l'échelle de mesure des *questions familiales* sont de nature catégorique (par exemple, « oui », « non », « je ne sais pas »). Étant donné la nature distincte aussi bien des sujets abordés dans les deux sections de l'échelle que des techniques d'évaluation utilisées, chaque section est traitée comme une échelle séparée. Nous avons nommé la première échelle *attitudes familiales* et la deuxième, *soutien perçu*.

Échelle de mesure des attitudes familiales

Une analyse de fiabilité initiale des quatorze éléments de l'échelle de mesure des *attitudes familiales* a donné un résultat tout à fait acceptable, soit un coefficient alpha de Cronbach de .76. L'analyse de l'échelle à l'aide d'un seul facteur a expliqué 27 p. 100 de la variance des réponses. Toutefois, six des quatorze éléments avaient des corrélations partie-tout plutôt faibles, ce qui laisse entendre que l'échelle donne peut-être un aperçu de plus d'un facteur central. En outre, plusieurs des éléments avaient des saturations de facteur inférieures à .4 – n'atteignant pas la valeur d'exclusion minimale, ce qui laisse à nouveau entendre qu'une solution à facteur unique n'est peut-être pas la meilleure représentation de l'échelle.

Une seconde analyse exploratoire des éléments de l'échelle de mesure des *attitudes familiales* fait apparaître deux facteurs distincts : les *préoccupations familiales* et les *attitudes positives*. Les analyses de fiabilité subséquentes de ces deux facteurs ont indiqué que le facteur relatif aux *préoccupations familiales* avait un coefficient alpha élevé d'une valeur de .81. Les analyses de fiabilité des éléments représentés dans le facteur relatif aux *attitudes positives*

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étaient cependant décevantes, puisque le coefficient alpha de Cronbach n'était que de .49. Les éléments compris dans le facteur relatif aux *attitudes positives* ne semblent pas faire ressortir une dimension sous-jacente unique, si bien qu'il n'y aurait pas lieu d'inclure ces éléments dans les études ultérieures.

Même si le facteur relatif aux *préoccupations familiales* s'est avéré fiable dans les analyses précédentes, il ne s'agit peut-être pas de la version la plus valide de l'échelle de mesure des *questions familiales*. Par conséquent, une analyse monométhode-multimesure a également été effectuée pour déterminer la validité relative des échelles de mesure des *préoccupations familiales* et des *attitudes familiales*. Deux versions de l'échelle de mesure des *attitudes familiales* ont été utilisées dans cette analyse : 1) une version qui comprend les quatorze éléments, 2) une version révisée de onze éléments. La version révisée de onze éléments a été conçue de façon à préserver le plus possible l'échelle initiale. Dans ce cas, les résultats analytiques des facteurs à double dimension ont été laissés de côté et seuls les trois éléments les plus faibles des quatorze éléments initiaux ont été éliminés. L'analyse monométhode-multimesure a révélé des corrélations qui ont confirmé la validité de la plupart des hypothèses. En outre, le mode de corrélation produit était semblable entre chacune des versions de l'échelle de mesure des *attitudes familiales*, de l'échelle de mesure des *préoccupations familiales* et les autres mesures relatives au pré-déploiement. En effet, les tests d'écart réduit n'ont révélé aucune différence significative dans la magnitude des corrélations entre chacune des trois versions de l'échelle et les autres mesures relatives au pré-déploiement.

Soutien perçu

On a aussi effectué des analyses des éléments évaluant la perception de l'accessibilité aux sources et aux services de soutien. Il n'a pas été possible ici de recourir aux analyses traditionnelles de la fiabilité et des facteurs exploratoires étant donné la nature catégorique des choix de réponse associés à cette section du questionnaire. Ce sont plutôt des fréquences et des pourcentages qui ont été calculés pour déterminer l'accessibilité relative perçue de chaque source et service de soutien. Dans l'ensemble, les personnes dans cet échantillon ont perçu comme accessibles à leur famille la plupart des sources et des services de soutien énumérés. La majorité des répondants s'attendaient à recevoir un peu plus de soutien de la part des membres de leur famille, de leurs amis et de leurs voisins que de sources militaires officielles. Ce dont ils étaient le moins sûrs, c'était de l'accessibilité de services de soutien civils.

Conclusions

Les résultats de cette recherche indiquent que les préoccupations familiales sont un enjeu important et constant pour le personnel militaire déployable. Parallèlement, le temps passé loin des membres de la famille est jugé comme l'un des aspects les plus stressants de la carrière militaire. Il est donc essentiel d'évaluer le niveau des préoccupations familiales pour assurer le bonheur et l'efficacité du personnel militaire. D'après les analyses psychométriques présentées ici, il conviendrait de conserver sept des quatorze éléments initiaux de l'échelle de mesure des *attitudes familiales* dans les études futures. L'échelle a une bonne fiabilité, une structure de facteurs cohérente et convaincante, et elle est liée de façon prévisible à d'autres échelles d'évaluation du stress en milieu militaire.

L'existence et l'efficacité des services de soutien familiaux peuvent, pour le personnel militaire, grandement atténuer certaines de ces préoccupations familiales. L'évaluation de la perception qu'ont les soldats de l'existence de services de soutien représente une étape importante dans le processus d'analyse. Les réponses à ce genre de questions peuvent assurément jeter la lumière sur l'accessibilité et la visibilité des services de soutien militaires de cette nature. Les résultats obtenus sur cette échelle peuvent contribuer à choisir les services de soutien qu'il y aurait lieu de perfectionner ou de multiplier. Il est proposé d'ajouter à l'échelle de mesure du *soutien perçu* des éléments évaluant la perception de l'efficacité de chaque service et l'intention des personnes d'en faire usage.

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Introduction

Separation from family members is a fact of life for modern military personnel. Although there are variations, most countries, including Canada, have deployments that are typically 6 months in duration [1]. Moreover, the recent trend toward downsizing of military forces means that soldiers can now expect to be deployed much more often during the course of their military careers [2]. This means even more time spent away from families. Not surprisingly, time away from family is one of the most significant drawbacks of a military career. In one study, separation from loved ones was the most frequently endorsed negative aspect of a military career [3]. Indeed, a full 82% of respondents rated separation from loved ones as a negative aspect of military service.

Several large-scale surveys of American troops have indicated the importance of family separation as a deployment stressor [4; 5; 6]. Halverson and colleagues highlighted the most ubiquitous family-related stress: simply being separated from loved ones (see also [7]). Over 33% of their sample of 3,205 soldiers rated being away from their families as 'quite a bit' or 'extremely' stressful. Indeed, family separation was the third most stressful aspect of deployment. In addition to simple separation from family, over 50% of the married soldiers reported significant stress from concerns or problems regarding their spouses, and almost 66% of the respondents who had children reported significant stress from problems with their children. Interestingly, it was also found that thinking about family was considered by the overwhelming majority of soldiers to be a positive way of coping with the other stresses of the mission.

Family concerns are heightened by several factors [6]. For instance, some newly posted soldiers are deployed before their families have a chance to get settled into a new community. Additional concern arises when formal or institutional supports for families do not exist or are not easily accessed. A related issue is long distance communication between deployed personnel and their family members. While both letters and telephone calls home are considered very positive and important means for coping with deployment stress, difficulty in establishing communications could also be significant sources of frustration [6]. The U.S. data showed that commercial phone access was often limited to very inconvenient hours and was not subsidized, making communication with home a difficult and an expensive proposition, especially for those in the lower ranks. In addition, the stress due to family separation was greater for soldiers who had been deployed multiple times. Other work has highlighted the special concerns of deployed single parents regarding their children. The availability of an ex-spouse to care for a child did not completely alleviate these concerns and could even introduce additional insecurities. "*[S]omebody said ... to me, 'Well, what if [your kids] don't want to come back [from your ex-husband after your tour ends]?'. And I'm thinking 'Whoa' and I said 'That's a chance I'm going to have to take and just hope that there's enough love there between all of us' ... But that's a scary thought for me.*" [8].

The proceeding studies summarized above have addressed the stress associated with family concerns while soldiers are deployed away from home. However, a recent study of Canadian Forces augmentees suggested that family issues were also an overriding concern well before soldiers left on their deployment [8]. Indeed, family was a significant concern mentioned in

each discussion group in that study. Nearly all of the participants talked about the stress experienced by their partners as a result of soldiers' extended and sometimes frequent absences from home. Parents were also concerned about the impact of their absences on their children, particularly when their children were pre-schoolers or adolescents. In some cases peacekeepers mentioned family concerns in terms of the conflict between meeting their family's needs and meeting work demands. *"It's tough, do I go and leave my family with little or no family support systems behind you or do I not go and face possible career implications?"* Other respondents noted that they were willing to go on repeated tours themselves, but were concerned about the strain that it put on their families. *"I don't think any of us actually tire of going over, no matter what you do. It's your family tires of it. They're the ones that get worn out and get tired of it."* [8].

These reports are corroborated by an interview and survey study of American peacekeepers that were about to deploy to Bosnia [7; 5]. Bartone and Adler [9 p. 3] concluded that: "There was substantial concern about the welfare of families during the separation, particularly for soldiers drawn from the outlying areas. This concern was frequently related to the loss of services in some communities as a result of the reduction of Army forces in Europe".

Other sources indicate a wide range of feelings experienced by military spouses prior to deployment -- not all of which are positive. As one U.S. military spouse put it when they learned of their partners' impending deployment: *"I was disappointed. I thought 'here we go again, being a single parent'"*. A second spouse summed it up this way: *"[b]ased on the previous deployment I knew what to expect: long nights, long weekends and that I'd get every complaint"* [10]. The deploying spouse or parent must deal with all of these emotions in one way or another (see also [9]).

The resultant impact of concerns about family appears to be quite significant. Importantly, the United States data revealed that deployed soldiers who reported higher levels of family concerns and problems also experienced higher levels of psychological and physical symptoms [6]. A further study conducted during a military deployment found that daily stressors including family separation were related to self-reports of PTSD symptoms [4]. The relevance of family issues is also indicated by its explicit inclusion in recent theoretical models of deployment [1; 11]. Although these results are highly suggestive, there is no empirical data on the relation between family issues and concerns and soldiers' mental and physical health during predeployment. This report represents the first step in exploring this relation. We assessed the psychometric properties of a measure of family concerns and issues included in a large questionnaire tapping the human dimensions of operations (see [12]).

The Human Dimensions of Operations (HDO) project

Recently the CF has initiated a number of research projects to measure factors related to operational stress. One of these initiatives, the HDO project (see [13; 14]), headed by the Operational Effectiveness Section of DHRRE, involves a large-scale survey of CF personnel. The HDO is a multidimensional questionnaire that seeks to quantify the various sources, correlates, and consequences of operational stress as it affects CF personnel. Different versions of the HDO questionnaire have been developed to assess operational stress at several points along the deployment cycle: predeployment, employment, and postdeployment.

In many cases, the HDO questionnaire incorporates published measures in their entirety, although several scales were modified to apply to a Canadian peacekeeping context. In other cases, original scales were developed specifically for the HDO questionnaire. The present report summarizes a psychometric evaluation of the *Family Issues* scale, one of the measures developed specifically for the HDO Predeployment questionnaire. This work was undertaken as part of the on-going research collaboration between DCIEM's Command Group and DHRRE.

Psychometric analyses and scale refinement

Scale refinement typically includes factor and reliability analyses. Factor analysis identifies the central underlying dimensions (i.e., factors) of a scale [15]. In this case, factor loadings represent the weight of a questionnaire item on a particular factor. Reliability analysis aids in ensuring that all the items on a scale, or within a factor, measure the same construct or phenomenon [16]. In reliability analyses, achieving a high Cronbach alpha value (i.e., a value reflecting the overall internal consistency of the scale) and the relation of each item to the scale (i.e., high values on item-total correlations) are particularly important.

Scale refinement is usually an iterative process, involving multiple factor and reliability analyses in order to ensure optimal properties. This approach has been used to develop other scales such as: Need for Cognition [17], Personal Need for Structure [18] and the Big Five Inventory [19; 20]. Establishing the factor structure and the reliability of a measure does not ensure a measure's validity, but they are nonetheless considered essential techniques in the assessment of overall psychometric quality [16].

The multitrait-multimethod matrix, (MTMT; [21; 22] is one of the most common approaches used for establishing the construct validity of a newly developed measure. MTMT relates the new measure under consideration to similar constructs assessed with different measurement methods (e.g., self-reports, others' reports, behavioural observations). The construct validity of the new scale is presumed if it relates in predictable ways with similar constructs across measurement methods (see [23]). More specifically, relating a newly developed measure with an established scale presumed to measure similar constructs assesses convergent validity. Discriminant validity is assessed by relating a new measure with a second, and presumably unrelated, established scale. In this report, we used a variation of this technique referred to as a multitrait-monomethod matrix (also MTMT), as related constructs are assessed only with regard to self-report methods.

Note however, that the original aim of the HDO Predeployment questionnaire was to assess variables related to peace support missions, not to perform psychometric refinements of new measures. Thus, the validity analyses reported here are opportunistic and exploratory in nature. Specifically, we take advantage of the scales within the HDO predeployment questionnaire to begin to ascertain the validity of the *Family Issues* scale.

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Method

Respondents

Demographic questions in the predeployment questionnaire were categorical rather than continuous in nature. For instance, respondents indicated their age group (e.g., 19-25) rather than their actual age. Thus, means and standard deviations for the demographic variables of this sample are not available.

The predeployment sample consisted of 297 male and 21 female Canadian Forces Land Force personnel whose ages ranged from 19 to 37 years. Respondents served from 1 to 15 or more years in the military and included 249 regular force personnel, 17 augmentees, and 57 reservists. A range of ranks was represented in the sample, although as Table 1 indicates officers were underrepresented. One hundred and sixty-four of the respondents were married, 130 were single, 18 separated or divorced, and 9 described their marital status as other. One hundred and eight-seven of the respondents had no dependents, and 109 had at least one dependent. This was the first peacekeeping tour for 157 of the respondents, while 162 had been on at least one prior peacekeeping mission. Approximately 50% of the respondents reported no medical visits in the prior six months (n = 156), while 165 individuals visited a doctor at least once in the same time period. Table 1 presents the detailed breakdown of the frequencies for each of the demographic characteristics of this sample.

Measures

The *Family Issues* scale, presented in Table 2, is a 15-item measure that is organized into two sections. The first section includes 14 items family-related attitudinal statements tapping a variety of thoughts and feelings that a respondent may experience during their upcoming deployment. Thus, we refer to items in the first section as the *Family Attitudes* scale. Respondents are asked to indicate their degree of agreement to each item on a 5-point Likert scale (i.e., 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). Respondents were also given the option of indicating if the item was not applicable to their situation.

The second section of the scale, also presented in Table 2, included a single item with 12 subparts (i.e., a to l), and assesses the sources of support respondents believed were available during their absence to their families. We refer to this section as the *Perceived Support* scale. The sources of support ranged from institutionalized support services available to the families of military members (e.g., military social workers, chaplains, and rear party support activities), to non-formal support sources such as family, neighbors, and friends. Response options to these 12 items included 'yes', 'no', and 'don't know'.

Three additional self-report measures, also included in the predeployment questionnaire, were used in the monomethod-multimeasure correlational analysis. The psychometric properties of each of these measures has been established in prior research [24; 25; 26; 27].

The *SIGNS* is a 36-item self-report measure of depression and withdrawal, hyper-alertness, generalized anxiety, and somatic complaints. Twenty-one items were taken from a published symptom checklist (Bartone, Ursano, Wright, & Ingraham, 1989), and fifteen new items tapped fatigue, anxiety, and psychotrauma (Dobreva-Martinova, 1998b).

The *Service Experiences Scale* contains 12 items from the Mississippi Scale for combat-related Posttraumatic Stress Disorder (PTSD) (Keane, Caddell & Taylor, 1988). In addition, the *Service Experiences Scale* contains two items assessing the traumatic events experienced by the respondent, and a final item in which the respondents indicate their willingness to undertake a future overseas operational deployment.

The *Stress in Military Service* scale, developed by DHRRE (see Dobreva-Martinova, 1998a), has 35 items tapping several sources of stress for military personnel including work environment, external conditions, combat stressors, and career issues.

Procedure

Questionnaire administration

Representatives of DHRRE administered the Predeployment questionnaire to CF personnel in a base training building approximately 48 hours before deploying to a peace support mission in Bosnia. The HDO was administered to a group of respondents simultaneously, but was completed individually. French and English versions of the predeployment questionnaire were made available to respondents. Participation in the study was completely voluntary and anonymous. A written cover page outlined the purpose of the research (See Appendix A).

Psychometric analyses

A series of analyses were conducted in order to assess the psychometric properties of the Family Issues Scale, and to facilitate item refinement. Inspection of the items comprising the Family Issues scale revealed two distinct sections. The first section included 14 items that assessed respondents' family-related attitudes in anticipation of their upcoming deployment with a Likert scale (i.e., 1 – strongly disagree to 5 – strongly agree). The second section assessed respondents' knowledge of the availability of family oriented support services (perceived support). Response options to the perceived support section were categorical in nature (i.e., 'yes', 'no', 'don't know'). Given the distinct issues addressed in the two sections of the Family Issues Scale, and because these sections used different scaling techniques, each section was treated as a separate scale. The first section we named *Family Attitudes* and the second section was named *Perceived Support*.

Exploratory factor analyses (EFA) and reliability analyses were conducted on the *Family Attitudes* scale. Analyses also include correlations of the family related scales with additional self-report measures included in the HDO Predeployment Survey presented in a Monomethod-Multitrait matrix.

The categorical nature of the *Perceived Support* scale precluded the use of traditional psychometric analytical procedures. However, these questions do yield useful information concerning the perceived availability of support resources. Thus, frequencies of endorsement of each category for each support source were calculated.

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Results

Family Attitudes scale

Exploratory factor analyses I

An initial exploratory factor analysis of the 14 attitudinal items of the *Family Attitudes* scale resulted in a one factor solution accounting for 27 % of the variance in responses. As Table 3 shows, factor loadings ranged from -.02 to .80. However, several items failed to make the traditional item retention cutoff point of .40. Items not meeting the cutoff were:

1. item 3: "Going on this tour will bring me closer to my family"
2. item 4: "I am satisfied with the support set up for my family by my home unit/base during
3. my coming absence"
4. item 5: "I am satisfied with the support set up for my family by other agencies within the CF during my absence"
5. item 6: "My family would prefer to seek support from outside the CF such as friends, relatives, civilian support services during my absence"
6. item 8: "My family is worried about my safety on the coming tour",
7. item 10: "My family is proud of me going on the coming tour"

Although the single factor did account for an acceptable amount of variance in responses, the slope of the skree plot (see Figure 1) and the low factor loading of almost half of the items suggest that the scale may be better represented by more than one factor.

Reliability analyses I

Reliability analyses were conducted on the 14-item Family Attitudes Scale. These analyses, presented in Table 4, revealed a Cronbach's alpha of .76, with inter-item correlations ranging from .01 (Item 10 - "My family is proud of me going on the coming tour") to .63 (Item 14 – "Going on this tour has caused me concerns about my family"). The average inter-item correlation was .17, a value substantially reduced by item 10 ("My family is proud of me going on the coming tour"), item 4 ("I am satisfied with the support set up for my family by my home unit/base during my coming absence"), and item 5 ["I am satisfied with the support set up for my family by other agencies within the CF (Family Resource Centre, padres) during my

absence"]. Item means ranged from 2.40 (Item 11 – "I foresee difficulties adjusting back into my family when I return home at the end of this tour") to 4.57 (Item 7 – "The opportunity for me to phone home will be important to my family"). Item standard deviations ranged from .75 to 1.24 (Item 7 – "The opportunity to telephone home will be important to my family" and Item 2 "My mid-tour leave will be important to my family", respectively).

Exploratory factor analyses II

Due to the equivocal results of the initial round of psychometrics, we conducted further analyses, presented in Table 5, to refine the *Family Attitudes* Scale. A two-factor analytical solution provided the most interpretable factors. The first factor, *Family Concerns* (items 1, 2, 9, 11, 12, 13, and 14) accounted for 26% of the variance in responses. The second factor captures *Positive Attitudes* (items 4, 5, and 7) of the variance in responses. In this case, a decision was made to also include item 3 ("Going on this tour will bring me closer to my family") and item 10 ("My family is proud of me going on the coming tour.") on the second factor as they have high face validity for factor tapping positivity. The *Positive Attitudes* factor with all five items accounted for 14% of the variance in responses to the Family Attitudes scale.

Reliability analyses II

Table 6 presents the reliability analyses that were conducted on the *Family Concerns* and the *Positive Attitudes* factors. The 7 items comprising the *Family Concerns* subscale yielded a very solid Cronbach's alpha of .81. Item-total correlations ranged from .27 (Item 9 – "My family is worried about their own safety during the period when I shall be absent on tour"), to .72 (Item 14 – "Going on this tour has caused me concerns about my family"). The average inter-item correlation for these statements was .39. Descriptive analyses of these items produced mean values from 2.40 (Item 11 – "I foresee difficulties adjusting back into my family when I return home at the end of the tour") to 3.97 (Item 2 – "My mid-tour leave will be important to my family").

Similar analyses conducted on the *Positive Attitudes* factor revealed it to be unreliable. As listed in Table 7, the Cronbach's alpha for the *Positive Attitudes* factor was a low .49, with item-total correlations ranging between .17 (Item 10 - "My family will be proud of me going on this coming tour") and .38 (Item 5 – I am satisfied with the support available for my family through other agencies within the CF"). Inspection of the alpha if item deleted scores for this factor indicated that no one particular item was responsible for reducing the overall Cronbach alpha value. Thus, the elimination of items will not improve the reliability of this factor.

Monomethod-multimeasure analysis

We conducted a multimeasure – monomethod correlational analyses relating both the single factor solution of the *Family Attitudes* scale (i.e., Exploratory Factor Analyses I) and *the*

Family Concerns factor revealed by the second exploratory factory analysis with each of three self-report measures (i.e., *SIGNS*, *Service Experience*, *Stress in Military Service* and scales) in the Predeployment Questionnaire. Although each version of the scale has respectable to strong reliabilities, one version may be superior in terms of the pattern of correlations with the other measures in the Predeployment Questionnaire.

Because we were interested in preserving as many of the original *Family Attitudes* scale items as possible, we also created a *Revised Family Attitudes* scale (see Table 8 for the psychometric summary of this scale). In the revised version of the scale, we eliminated only the three weakest items from the original overall scale (i.e., Exploratory Factor Analyses I), and disregarded the factor analysis that revealed a two factor solution (i.e., Exploratory Factor Analyses II). Specifically, the *Revised Family Attitudes* scale eliminated the following items:

1. item 10: "My family is proud of me going on the coming tour"
2. item 4: "I am satisfied with the support set up for my family by my home unit/base during my coming absence",
3. item 5 "I am satisfied with the support set up for my family by other agencies within the CF (Family Resource Centre, padres) during my absence"

A reliability analysis conducted on the *Revised Family Attitudes* scale yielded a Cronbach's alpha of 79. Item-total correlations ranged from .24 (item 6 - "My family would prefer to seek support from outside the CF such as friends, relatives, civilian support services during my absence") to .67 (item 14 – "Going on this tour has caused me concerns about my family"). The average inter-item correlation was .29. The revised 11-item *Family Attitudes* scale was also related with the three other HDO self-report measures in the multimeasure – monomethod correlational analysis.

Nine measures, derived from the *SIGNS*, *Service Experiences*, and *Stress in Military Service* scales, were used to assess the validity of the two versions of the *Family Attitudes and the Family Concerns* scale in the monomethod-multimeasure analysis:

1. *SIGNS* - total score
2. Depression factor of SIGNS
3. Hyperalertness factor of SIGNS
4. Anxiety factor of SIGNS
5. Somatic Complaints factor of SIGNS
6. *Stress in Military Service* - total score
7. *Service Experiences* - total score
8. *Positive Emotions and Motivations* factor of the scale

9. Negative Thoughts, Emotions, and Intrusive Memories factor of Service Experiences scale.

Cronbach's alpha reliability coefficients were calculated for each measure prior to conducting the correlational analysis proper (see Table 9).

Recall, past research has indicated that family concerns were related to increases in self-reports of physical and psychological symptoms, as well as PTSD symptoms, at least among deployed troops (See [4; 5; 6]). Thus we might expect higher levels of concerns and worries about family would be reflected in higher scores on both versions of the *Family Attitudes* scales as well as the *Family Concerns* scale. These higher scale scores should, in turn, be related to higher scores on the *SIGNS* scale as well as it's subscales representing psychological distress (depression, anxiety and hyperalertness) and physical symptoms (somatic complaints). On the other hand, there is no reason to expect that greater family concerns should be related to expressions of either negative or positive emotions and motivations (subscales of the Stress in Military Service scale) or to experiences of major stress that occurred before the deployment.

As Table 9 also indicates, the pattern of correlations among the 14 and 11-item versions of the *Family Attitudes* scale, the 7-item *Family Concerns* scale and the nine validity measures were very similar in magnitude. Indeed, two-tailed tests of significance conducted on the correlations among each of the versions of the *Family Attitudes* scale, the *Family Concerns* scale and the validity measures produced no statistically significant differences.

More specifically, results of a correlational analysis indicated that higher scores on the *Family Attitudes* and *Family Concerns* scales were positively related to both psychological and physical symptoms assessed by the *SIGNS* scales. Also as predicted, there was little relation between family concerns and the expression of positive emotions and motivations or previous experiences of major stress (all p's ns). Interestingly, there were unexpected positive correlations between the *Family Attitudes* and *Family Concerns* scales with *the Stress in Military Service* scale (r's = .24 - .29, p's < .001) and the *Negative Thoughts and Intrusive Memories* factor of the Service Experiences Scale (all r's = .18 - .19)

Family support sources and services

The second portion of the *Family Issues* scale lists 12 support sources and services that are traditionally used by deployed military personnel. Seven items refer to official military support services (e.g., military Family Resource Centre, UN mission line, military social worker, military chaplain, etc.). Five items refer to more informal civilian support services (e.g., friends, neighbors, and relatives). Respondents indicated whether they believed each source or service would be available to their family during the upcoming deployment (yes / no / don't know).

Frequencies of the response options for each support service or source are listed in Table 10. Overall, perceptions of availability ranged from a high of 89% for Friends to a low of 31.8% for Civilian Support Services. As Table 10 indicates, the Military Family Resource Centre and the UN Mission Line were perceived to be available sources of support by 75% of the

sample. Military chaplain support services were perceived as available by just over 70% of the sample, rear party support activities were endorsed by 65% of the sample, and the military social worker was perceived as being available for family support by 52.2% of the sample. The formal support sources perceived as least available to military families were the Area Hotline (47.5%) and the military administrative/logistic support services (45.06 %). Indeed, 23.15% of the sample indicated that administrative/logistic support services were actually not available to their families, as opposed to merely being unsure if the service was available.

It was clear that respondents felt assured that informal support sources would be the resources most available to their families. Almost 90% of the sample felt that friends and neighbors (88.9% and 87.7%, respectively) would be available to assist their families while the serving member was away. Neighbors were perceived as being somewhat less available than friends and relatives, although the overall level of their perceived availability was still quite high (77.8%). The greatest variation occurred in perceptions of the availability of unofficial support groups. In this case, almost 43% of the respondents felt that groups such as spouses clubs would be available to their families. A full 25% indicated that these were not perceived as an available support source, and about 30% were unsure. Finally, as Table 10 also indicates, the highest level of uncertainty was with regard to the availability of civilian support services. In this case, almost half the sample (41%) responded that they were unsure as to whether civilian support agencies were available to their families. Only 31.8% of the sample responded yes, and 22.5% responded no, to this item.

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Summary and conclusions

A series of psychometric analyses were performed on the *Family Issues* scale included in the HDO Predeployment Survey. The first analysis explored the psychometric properties of the 14 attitudinal items comprising the first section of the Family Issues scale, *Family Attitudes*. Initially the scale was treated as a single scale representing a unitary construct. Although results of the reliability analysis were adequate, 6 of the 14 items had low item-total correlations. Results of the factor analysis also indicated the scale might assess a multi-factorial construct.

A second set of psychometric analyses indicated a two-factor solution, *Family Concerns* and *Positive Attitudes*, which might better describe the dimensionality of the *Family Attitudes* scale. Together the *Family Concerns* and *Positive Attitudes* factors accounted for 40% of the variance in responses on the scale. Results of reliability analyses conducted on each factor separately revealed the *Family Concerns* factor to be highly reliable (alpha = .81). Results were not as encouraging for the *Positive Attitudes* factor. This factor produced a low alpha reliability coefficient of only .49. Overall then, the 14 and 11-item versions of the overall *Family Attitudes* scale are reliable, as is the more rigorously empirically derived *Family Concerns* scale. The *Positive Attitudes* scale, also derived from the factor analysis of the *Family* Attitudes scale is much weaker, and does not warrant inclusion in future work on its own, at least in its present form.

Correlational analyses were also conducted to assess the relative validity of the 14 and 11-item versions of the *Family Attitudes* scale and the *Family Concerns* scale with the other scales in the HDO Predeployment Questionnaire. Results showed that all scales yielded the same pattern of correlations. The magnitude of the correlations of these measures and the validity scales were also directly compared via *z*-tests. In this case there were no statistically significant differences in the correlations of the 14 or the 11-item versions of the *Family Attitudes* scale or the 7-item *Family Concerns* scale with the other predeployment scales.

Moreover, the direction of correlations tended to support hypotheses. Greater concerns regarding family were related to more self-reports of physical and psychological symptoms tapped by the *SIGNS* scales. Also as expected, higher family concerns were unrelated to positive aspects tapped by the service experiences scale or to experiences of major stress experienced before the deployment. Note that the correlational results for both *the Service Experiences Scale* (SES) total score and the SES positive subscale should be interpreted with caution due to the low Cronbach alpha values.

Higher scores on the *Family Attitudes* and the *Family Concerns* scales were unexpectedly related to higher scores on *the Stress in Military Service* scale. It is not entirely clear why this was the case. One explanation may be due to the fact that the *Stress in Military Service* scale includes 4 items that directly assess family-related issues ("time spent away from your family", "problems with your family", "problems with or in your family" and "concern about the impact of your deployment on your family"). A second correlational analysis of the relation between family concerns and the stress in military service scale without the family related items did decrease the magnitude of correlations, although not significantly so.

Scale refinement recommendations

Family Attitudes scale

Analyses of the 14 and 11-item versions of the *Family Attitudes* scale revealed that each is about equally reliable, and each version was correlated in a similar fashion to other scales in the predeployment questionnaire. Despite the similar reliability profiles, the *Family Concerns* factor of the scale appears to be slightly superior in terms of strict psychometric criteria. For instance, the 7-item *Family Concerns* factor is a highly reliable dimension (alpha = .81) with an average inter-item correlation of .39. Moreover, the items on this factor appear to tap a unitary and cohesive psychological construct of concern related to being away from family members during a deployment. The items that met the minimum loading cutoff for this factor are:

1. item 1: "This tour will be stressful for my family."
2. item 2: "My mid-tour leave will be important to my family."
3. item 9: "My family is worried about their own safety during the period when I shall be absent on tour."
4. item 11: "I foresee difficulties adjusting back into my family when I return home at the end of the tour."
5. item 12: "I think my family relationships will have changed when I return home."
6. item 13: "My family and I will need time to adjust and get to know each other again when I return home."
7. item 14: "Going on this tour has caused me concerns about my family."

As family concerns appear to be among the most prevalent and significant issues experienced by soldiers both prior to and during deployments, assessing this dimension of psychological functioning is essential.

A reliability analysis of the second factor associated with Family Attitudes, *Positive Attitudes*, was not encouraging producing a very low reliability coefficient in this sample. If there is continuing theoretical interest or specific research questions concerning the impact of positive family attitudes, our recommendation is that a new scale tapping this positive dimension be constructed.

Perceived Support scale

As lengthy periods of time away from family members is one of the most distressing aspects of a military career, assessing soldiers' perceived availability of support resources for their family members is important. Answers on this scale may provide essential information for improving both the availability and visibility of current and anticipated sources of family support. Policy decisions about which support sources may benefit from fine-tuning or expansion may also be facilitated with information about soldiers' perceptions of the effectiveness of the services and their intention or likelihood of using the various sources of support. Finally, there may be ambiguity concerning what is meant by civilian support services. This potential ambiguity could be eliminated with the use of specific examples.

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Table 1: Frequencies of demographic variables for the predeployment sample

VARIABLE		N	CUMULATIVE COUNT	% OF CASES
RANK	Private	89	89	27 64
	Jr NCM	199	288	61.80
	Sr NCM	25	313	7.76
	Officer	9	322	2 80
	Missing	2	324	.62
GENDER	Male	297	297	93 40
	Female	21	318	6.60
	Missing	6	324	1.89
MARITAL STATUS	Married	164	164	51.57
	Single	130	294	40.88
	Separated/Divorced	18	312	5.66
	Other	6	318	1.89
	Missing	6	324	1.89
NUMBER OF DEPENDENTS	None	187	187	59 17
	1	53	240	16 77
	2	40	280	12.66
	3	25	305	7.91
	4	9	314	2.85
	5 or more	2	316	.63
	Missing	8	324	2.53
NUMBER OF PREVIOUS PEACE SUPPORT TOURS	none	157	157	49.22
	1	87	244	27.27
	2	41	285	12 85
	3	22	307	6.90
	4	5	312	1.57
	5 or more	7	319	2.19
	Missing	5	324	1.57
YEARS OF SERVICE	0-4	99	99	30 84
	5-9	103	202	32.09
	10-14	74	276	23.05
	15 or more	45	321	14 02
	Missing	3	324	.94
AGE	17-21	27	27	8.36
	22-26	110	137	34.06
	27-31	80	217	24.77
	32-36	81	298	25.08
	37 or more	25	323	7 74
	Missing	1	324	.31
MEDICAL VISITS IN PRIOR 6 MONTHS	none	156	156	48.60
	1 or 2	136	292	42.37
	3 or 4	22	314	6.85
	5 or more	7	321	2 18
	Missing	3	324	93
MILITARY STATUS	Regular forces	249	249	77.09
	Augmentees	17	266	5.26
	Reservists	57	323	17.65
	Missing	1	324	.31

Table 2: The 14-Item Family Issues scale

PLEASE RESPOND TO EACH OF THE FOLLOWING STATEMENTS ACCORDING TO THE SCALE PRESENTED BELOW:

1	This tour will be stressful for my family.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
2	My mid-tour leave will be important to my family.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
3	Going on this tour will bring me closer to my family.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
4	I am satisfied with the support set up for my family by my home unit/base during my coming absence.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
5	I am satisfied with the support set up for my family by other agencies within the CF (family resource centre, padres) during my absence.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
6	My family would prefer to seek support from outside the CF such as friends, relatives, civilian support services during my absence.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
7	The opportunity for me to telephone home will be important to my family.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
8	My family is worried about my safety on the coming tour	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
9	My family is worried about their own safety during the period when I shall be absent on tour.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
10	My family is proud of me going on the coming tour.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
11	I foresee difficulties adjusting back into my family when I return home at the end of this tour.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
12	I think my family relationships will have changed when I return home.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
13	My family and I will need time to adjust and get to know each other again when I return home.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli
14	Going on this tour has caused me concerns about my family.	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	Not Appli

Table 2: The Family Issues Scale (cont'd.)

Which of the following services/sources of support do you think are available to your family if required during your absence?

MILITARY FAMILY RESOURCE CENTRE	YES	NO	DON'T KNOW
UN MISSION INFORMATION LINE	YES	NO	DON'T KNOW
AREA HOTLINE	YES	NO	DON'T KNOW
MILITARY SOCIAL WORK SERVICES	YES	NO	DON'T KNOW
MILITARY CHAPLAIN SUPPORT SERVICES	YES	NO	DON'T KNOW
MILITARY ADMINISTRATION/LOGISTIC SUPPORT SERVICES	YES	NO	DON'T KNOW
REAR PARTY SUPPORT SERVICES	YES	NO	DON'T KNOW
UNOFFICIAL SUPPORT GROUPS (E.G., SPOUSES' CLUB)	YES	NO	DON'T KNOW
CIVILIAN SUPPORT SERVICES	YES	NO	DON'T KNOW
FRIENDS	YES	NO	DON'T KNOW
RELATIVES	YES	NO	DON'T KNOW
NEIGHBOURS	YES	NO	DON'T KNOW

Table 3: Factor loadings of the 14-item Family Attitudes scale

Extraction: (Unrotated) Principal components

		FACTOR LOADING
1.	This tour will be stressful for my family.	**.69**
2.	My mid-tour leave will be important to my family.	**.64**
3.	Going on this tour will bring me closer to my family.	.36
4.	I am satisfied with the support set up for my family by my home unit/base during my coming absence.	.004
5.	I am satisfied with the support set up for my family by other agencies within the CF (family resource centre, padres) during my absence.	.11
6.	My family would prefer to seek support from outside the CF such as friends, relatives, civilian support services during my absence.	.31
7.	The opportunity for me to telephone home will be important to my family.	**.44**
8.	My family is worried about my safety on the coming tour	.34
9.	My family is worried about their own safety during the period when I shall be absent on tour.	**.50**
10.	My family is proud of me going on the coming tour.	-.02
11.	I foresee difficulties adjusting back into my family when I return home at the end of this tour.	**.67**
12.	I think my family relationships will have changed when I return home.	**.66**
13.	My family and I will need time to adjust and get to know each other again when I return home.	**.72**
14.	Going on this tour has caused me concerns about my family.	**.80**
PROPORTION TOTAL VARIANCE ACCOUNTED FOR:		.27

Note: Factor loadings > .40 are in boldfaced type.

Table 4: Reliability analysis of the 14-Item Family Issues scale

(N=309)

		ITEM MEAN	ITEM STD. DEV.	ITEM-TOTAL CORRELATION	ALPHA IF ITEM DELETED
1.	This tour will be stressful for my family.	3.30	1.09	.58	.72
2.	My mid-tour leave will be important to my family.	3.96	1.24	.51	.73
3.	Going on this tour will bring me closer to my family.	2.88	.97	.30	.75
4.	I am satisfied with the support set up for my family by my home unit/base during my coming absence.	3.53	.82	.07	.77
5.	I am satisfied with the support set up for my family by other agencies within the CF (family resource centre, padres) during my absence.	3.59	.80	.16	.76
6.	My family would prefer to seek support from outside the CF such as friends, relatives, civilian support services during my absence.	3.47	.90	.22	.76
7.	The opportunity for me to telephone home will be important to my family.	4.57	.72	.39	.75
8.	My family is worried about my safety on the coming tour	3.97	.81	.25	.75
9.	My family is worried about their own safety during the period when I shall be absent on tour.	2.61	1.08	.35	.75
10.	My family is proud of me going on the coming tour.	4.23	.75	.01	.77
11	I foresee difficulties adjusting back into my family when I return home at the end of this tour.	2.40	1.09	.49	.73
12.	I think my family relationships will have changed when I return home.	2.76	1.11	.47	.73
13.	My family and I will need time to adjust and get to know each other again when I return home.	2.63	1.14	.55	.72
14.	Going on this tour has caused me concerns about my family.	3.07	1.23	.63	.71
CRONBACH ALPHA: 76 STANDARDIZED ALPHA: 74 AVERAGE INTER-ITEM CORRELATION: 17					

Table 5: Exploratory factor analysis: factor loadings for the 14-Item Family Attitudes scale
Extraction Method: Principal components (Varimax normalized rotation)

		FAMILY CONCERNS	POSITIVE ASPECTS
1.	This tour will be stressful for my family.	**.66**	.30
2.	My mid-tour leave will be important to my family.	**.60**	.32
3.	Going on this tour will bring me closer to my family.	.31	**.33** *
4.	I am satisfied with the support set up for my family by my home unit/base during my coming absence.	-.11	**.75**
5.	I am satisfied with the support set up for my family by other agencies within the CF (family resource centre, padres) during my absence.	-.003	**.76**
6.	My family would prefer to seek support from outside the CF such as friends, relatives, civilian support services during my absence.	.28	.23
7.	The opportunity for me to telephone home will be important to my family.	.37	**.48**
8.	My family is worried about my safety on the coming tour	.33	.11
9.	My family is worried about their own safety during the period when I shall be absent on tour.	**.50**	-.002
10.	My family is proud of me going on the coming tour.	-.05	**.24** *
11	I foresee difficulties adjusting back into my family when I return home at the end of this tour.	**.71**	-.18
12.	I think my family relationships will have changed when I return home.	**.70**	-.24
13	My family and I will need time to adjust and get to know each other again when I return home.	**.74**	-.08
14.	Going on this tour has caused me concerns about my family.	**.82**	-.05
	PROPORTION OF TOTAL VARIANCE ACCOUNTED FOR:	**.26**	**.14**

Note: Factor loadings of retained items are shown in bold-faced type.
* indicates items retained due to high face validity

Table 6: Reliability analyses of the Family Concerns subscale (N=314)

		Item Mean	Item Std. Dev.	Item-Total Correlation	Alpha if deleted
1.	THIS TOUR WILL BE DEMANDING FOR MY FAMILY	3.32	1.08	.50	.79
2.	MY MID-TOUR LEAVE WILL BE IMPORTANT TO MY FAMILY	3.97	1.24	.47	.80
9.	MY FAMILY IS WORRIED ABOUT THEIR OWN SAFETY DURING THE PERIOD WHEN I SHALL BE ABSENT ON TOUR	2.61	1.08	.37	.81
11.	I FORESEE DIFFICULTIES ADJUSTING BACK INTO MY FAMILY WHEN I RETURN HOME AT THE END OF THE TOUR.	2.40	1.08	.59	.78
12.	I THINK MY FAMILY RELATIONSHIPS WILL HAVE CHANGED WHEN I RETURN HOME	2.76	1.12	.56	.78
13.	MY FAMILY AND I WILL NEED TIME TO ADJUST AND GET TO KNOW EACH OTHER AGAIN WHEN I RETURN HOME.	2.62	1.14	.62	.77
14.	GOING ON THIS TOUR HAS CAUSED ME CONCERNS ABOUT MY FAMILY.	3.06	1.24	.72	.75
CRONBACH ALPHA: .81 STANDARDIZED ALPHA: .81 AVERAGE INTER-ITEM CORR.: .39					

Table 7: Reliability analyses of the Positive Attitudes subscale: (N=314)

		Item Mean	Item Std. Dev.	Item-Total Correlation	Alpha if deleted
3.	GOING ON THIS TOUR WILL BRING MY FAMILY CLOSER TOGETHER.	2.89	1.0	.19	.49
4.	I AM SATISFIED WITH THE SUPPORT SET UP BY MY HOME UNIT/BASE DURING MY COMING ABSENCE.	3.54	.82	.37	.35
5.	I AM SATISFIED WITH THE SUPPORT AVAILABLE FOR MY FAMILY THROUGH OTHER AGENCIES WITHIN THE CF	3.59	.80	.38	.35
7.	THE OPPORTUNITY FOR ME TO TELEPHONE HOME WILL BE IMPORTANT TO MY FAMILY.	4.56	.72	.23	.45
10.	MY FAMILY IS PROUD OF ME GOING ON THE COMING TOUR.	4.22	.76	.17	.49
CRONBACH ALPHA: .49 STANDARDIZED ALPHA: .49 AVERAGE INTER-ITEM CORR.: .18					

Table 8: A revised 11-Item Family Attitudes scale (N=310)

		ITEM MEAN	ITEM S.D.	ITEM-TOTAL CORRELATION	ALPHA IF DELETED	FACTOR LOADING
1	This tour will be stressful for my family.	3.30	1.09	.60	.76	.69
2	My mid-tour leave will be important to my family.	3.96	1.24	.52	.77	.64
3	Going on this tour will bring me closer to my family.	2.88	.97	.27	.80	.36
6	My family would prefer to seek support from outside the CF such as friends, relatives, civilian support services during my absence	3.47	90	.24	.80	.31
7	The opportunity for me to telephone home will be important to my family.	4.57	.72	.35	.80	.43
8	My family is worried about my safety on the coming tour	3.97	.81	.26	.80	.34
9	My family is worried about their own safety during the period when I shall be absent on tour.	2.61	1.08	.38	.79	.50
11	I foresee difficulties adjusting back into my family when I return home at the end of this tour.	2.40	1.09	.52	.77	.67
2	I think my family relationships will have changed when I return home.	2.76	1.11	.51	.77	.66
13	My family and I will need time to adjust and get to know each other again when I return home	2.63	1.14	.59	.76	.72
4	Going on this tour has caused me concerns about my family.	3.07	1.23	.67	.75	.80
CRONBACH ALPHA: .80; STANDARDIZED ALPHA: .79; AVERAGE INTER-ITEM CORR.: .29						
PROPORTION OF TOTAL VARIANCE ACCOUNTED FOR: 34						

Table 9: Pearson correlations of total score on Family Attitudes scales and Family Concerns subscale (N=267)

	14-ITEM FAMILY ATTITUDES	11-ITEM REVISED FAMILY ATTITUDES	FAMILY CONCERNS
STRESS IN MILITARY SERVICE α = .93	.24 p=.000	.29 p=.000	.29 p=.0001
SIGNS – TOTAL SCORE α = .92	.22 p=.000	.22 p=.000	.21 p= 001
SIGNS - DEPRESSION α= .71	.21 p=.000	.22 p=.001	.21 p=.001
SIGNS - HYPERALERTNESS α = .70	.19 p=.002	.162 p=.015	.17 p=.005
SIGNS - ANXIETY α = .62	.17 p=.007	.12 p=.071	.13 p=.031
SIGN – SOMATIC COMPLAINTS α = .62	.15 p=.007	.16 p=.071	.15 p=.031
SERVICE EXPERIENCE SCALE (SES) α=.56	p=.002	p=.005	p=.003
SES – NEGATIVE α=.67	.18 p=.008	.20 p=.003	.19 p=.004
SES POSITIVE EMOTIONS α = .42	.095 ns	.05 ns	.020 ns
EXPERIENCE OF MAJOR STRESS BEFORE DEPLOYMENT α = .86	-.036 ns	.09 ns	.03 ns

Table 10: Frequencies for perceived availability of deployment support services & sources

ITEM	RESPONSE	FREQUENCY	PERCENT
Military Family Resource Centre	yes	245	75.62
	no	44	13.58
	don't know	32	9.88
	Missing	3	.93
UN mission line	yes	246	75.93
	no	19	5.86
	don't know	53	16.36
	Missing	6	1.85
Area Hotline	yes	154	47.53
	no	37	11.42
	don't know	128	39.51
	Missing	5	1.54
Military Social Worker	yes	169	52.16
	no	51	15.74
	don't know	96	29.63
	Missing	8	2.47
Military Chaplain support services	yes	233	71.91
	no	46	14.20
	don't know	39	12.04
	Missing	6	1.85
Military Administrative Logistic Support Services	yes	146	45.06
	no	75	23.15
	don't know	96	29.63
	Missing	7	2.16
Rear Party Support Activities	yes	213	65.74
	no	64	19.75
	don't know	41	12.65
	Missing	6	1.85
Unofficial Support Groups eg., Spouse club	yes	138	42.59
	no	81	25.00
	don't know	96	29.63
	Missing	9	2.78
Civilian Support Services	yes	103	31.79
	no	73	22.53
	don't know	133	41.05
	Missing	15	4.63
Friends	yes	288	88.89
	no	10	3.09
	don't know	14	4.32
	Missing	12	3.70
Relatives	yes	284	87.65
	no	17	5.25
	don't know	16	4.94
	Missing	7	2.16
Neighbors	yes	252	77.78
	no	35	10.80
	don't know	24	7.41
	Missing	13	4.01

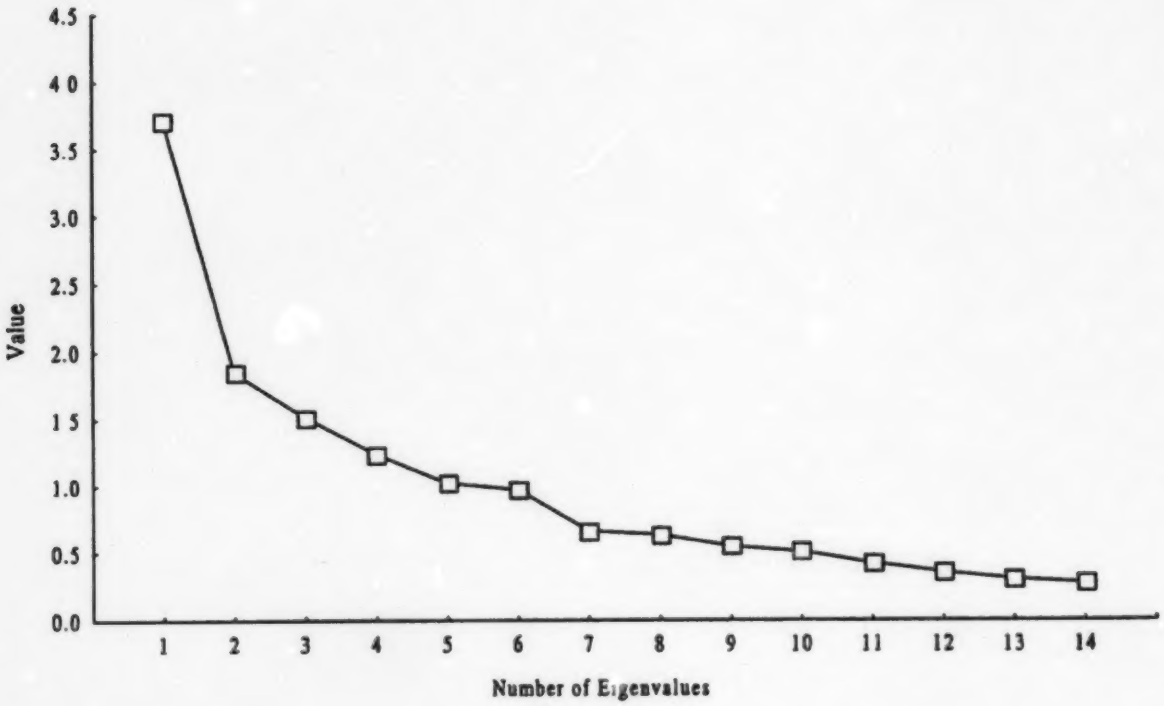


Figure 1. Plot of Eigenvalues of Family Issues scale

Appendix A: Introduction to predeployment survey and general instructions to respondents (English version)

Canadian Forces Human Dimensions of Operations Survey: Predeployment

Have your say – make your mark on the future.

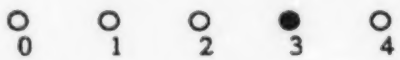
This survey is one of a series that examines the human aspects of operations. Your responses will be added to group data and used by Land Forces Command to enhance the effectiveness of future operations and to respond to the needs of members and families. Your honest and thouhtful responses are requested.

Your responses are treated confidentially.
No individual questionnaires will be made available to anyone except research personnel at the Personnel Research Team (prior name of DHRRE). Only grouped data will be reported.

General Instructions

There are several sections in this survey. A ***separate response form*** is provided so that the infomration can be scanned directly into a data base. To mark each response, ***fill in the appropriate circle*** on the response form.

For example:



Use a pencil. Do not use crosses or ticks. If you wish to change your response, please erase your first response and fill in the correct circle.

Please direct any questions or concerns to the administrator and return the completed survey directly to him/her.

-- Thank you for your participation --

DOCUMENT CONTROL DATA SHEET

1a PERFORMING AGENCY	2 SECURITY CLASSIFICATION
DCIEM	UNCLASSIFIED Unlimited distribution -
1b. PUBLISHING AGENCY	
DCIEM	

3 TITLE

(U) Psychometric Assessment and Refinement of the Family Issues Scale of the Human Dimensions of Operations (HDO) Project

4 AUTHORS

Megan. M. Thompson, Luigi Pastò

5. DATE OF PUBLICATION	6. NO. OF PAGES
May 1 , 2001	47

7. DESCRIPTIVE NOTES

8 SPONSORING/MONITORING/CONTRACTING/TASKING AGENCY
Sponsoring Agency:
Monitoring Agency:
Contracting Agency :
Tasking Agency:

9 ORIGINATORS DOCUMENT NO.	10 CONTRACT GRANT AND/OR PROJECT NO	11. OTHER DOCUMENT NOS.
Technical Report 2001-049	6KB15	

12 DOCUMENT RELEASABILITY

Unlimited distribution

13 DOCUMENT ANNOUNCEMENT

Unlimited announcement

14 ABSTRACT

(U) The present report summarizes psychometric analyses and recommendations for item refinement of the Family Issues scale a measure included a predeployment survey of operational stress among Canadian Forces personnel. Inspection of the items comprising the Family Issues scale revealed two distinct sections. The first section included 14 items that assessed respondents' family concerns in anticipation of their upcoming deployment with a Likert scale (i.e., 1 – strongly disagree to 5 – strongly agree). The second section assessed respondents' knowledge of the availability of family oriented support services. As the two sections of the Family Issues Scale assess distinct dimensions, and because these sections used different scaling techniques, each section was treated as a separate scale: Family Attitudes and Perceived Support.

Exploratory factor analyses of the items comprising the Family Attitudes scale yielded two separate factors: Family Concerns and Positive Attitudes. Subsequent reliability analyses of these two factors indicated that the Family Concerns factor had a robust alpha value of .81. Reliability analyses of the items within the Positive Attitudes factor were disappointing, however, resulting in a very low Cronbach's alpha of .49. The items within the Positive Attitudes factor do not appear to tap a single underlying dimension, and the inclusion of these items in further studies is not warranted.

A monomethod-multimeasure analysis was also conducted to determine the relative validity of the Family Concerns and the Family Attitudes scale. Two versions of the Family Attitudes scale were used in this analysis: 1) a version that included the entire 14 items and 2) a revised 11-item version, constructed to preserve as many of the original Family Attitudes scale. This analysis revealed patterns of correlations that substantiated most hypotheses. Moreover, the pattern of correlations was similar between the Family Concerns scale, two versions of the Family Attitudes scale, and the other predeployment measures. Indeed, z-tests revealed no significant differences in the magnitude of correlations between each of the three versions of the scale and the other predeployment measures. Ultimately the Family Concerns subscale was deemed to be the optimal version of the scale, due to it's more cohesive factor structure.

Descriptive analyses indicated the perceived availability of several support sources and services. In general most of the listed support sources and services were perceived as being available to respondents' families. Family, friends, and neighbors were expected to be somewhat more available than formal sources of support in the military. Respondents were the most unsure about the availability of civilian support services.

15. KEYWORDS, DESCRIPTORS or IDENTIFIERS

(U) Family Issues Scale; predeployment; Canadian Forces; family concerns; support services